

Cosmopolitan Time and a Prime Meridian

COMMON TO ALL NATIONS.

MEMORANDUM.

Although the subject discussed in the accompanying papers has not hitherto attracted general attention, it has to some extent met with consideration in various quarters, and it is probable that at no distant day public interest will be awakened to its importance.

Uniform time has long been employed for scientific purposes; it has been used in recording simultaneous magnetic observations, in geographical and astronomical calculations, in observing the movement of tides, the track of meteors, the waves of earthquakes, and in systematically recording meteorological phenomena.

It is only of late years that the rapidity of communications by Railway, and the facilities afforded by the Telegraph, have created new conditions which suggest and seem to demand some general system of uniformity in reckoning time in the ordinary occupations of life.

Those whose avocations bring them in contact with the inconveniences and complications which arise from our present notation, feel that the necessity of some improvement will before long become absolute.

The question is recognized to be cosmopolitan in its character; and although every where the difficulty may in some degree be felt, it is on the American Continent, in Canada and the United States, that it is rapidly gaining marked prominence.

A large amount of capital has been expended by the Dominion of Canada in the establishment of railways and telegraph lines, and the Government is now appropriating one hundred millions of dollars towards their construction to the Pacific Ocean.

In a few years the railways proposed will be completed, and they will extend over 75 degrees of longitude. The various clocks in the intervening distances, by which the lines will be operated, and the ordinary business of daily life carried on, will, under the present system of reckoning time, differ from point to point, until the maximum difference of about five hours is reached. Accordingly the geographical extent of territory, and the general advancement of the Dominion of Canada, point to the necessity, at no remote period, of seeking for some change in the present system of reckoning time.

The territory of the United States of America extends from Eastport in Maine to the western confines of Alaska, localities differing in longitude 100 degrees; in time, 6 hours and 40 minutes. Between Maine and the Pacific States of Washington, Oregon and California, the difference in time is nearly 4 hours. The railway system is developing in a marvellous manner in the United States; the population is ten times that of Canada. If, therefore, the question of time-reckoning claims attention in the Dominion, the necessity of its earnest consideration in the United States is still more manifest.

The American Metrological Society has had the subject under consideration. A careful report has been prepared setting forth the necessity for change, and advocating uniformity and accuracy in the system of time-reckoning. From this report it appears that there are no less than seventy-five distinct local time standards used by the Railways of the country, all differing the one from the other, the greatest difference reaching 3 hours and 58 minutes. The most prominent Railway managers have been consulted, and, with the exception of a small minority, they have placed on record the opinion that "a uniform time" would not only be a great convenience to the public and to the Railway employees, but would materially lessen the risk of accidents. It is accordingly strongly recommended that

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some means be taken to establish an absolute uniformity of time throughout North America.

Mr. Sandford Fleming, by whom the Intercolonial Railway of Canada was constructed, and who is now Engineer-in-Chief of the railway in process of construction to the Pacific, has had his attention directed to the inconveniences, confusion, and complications in time-reckoning, which are threatened by the rapid extension of the railway works under his charge, and he has suggested a practical solution of the difficulties which he foresees.

The question is likewise of general scientific interest ; and its solution is of value far beyond Canada, for it involves a question in which all civilized people are concerned. If uniformity be desirable in Canada and the United States, may it not be equally important to employ it throughout the whole world ? Does it not therefore become desirable to seek the co-operation of men of science in other countries, and if possible gain general concurrence in any scheme which may be proposed ?

At the instance of His Excellency, the Governor-General of Canada, the subject was brought under the notice of the Royal Society, of England. That distinguished scientific body has recently forwarded a communication to His Excellency, of which the following is an extract :—

“The President and Council of the Royal Society, have taken into consideration the proposals of Mr. Sandford Fleming, relative to time-reckoning and to the establishment of a Prime Meridian, which were forwarded by the Council of the Canadian Institute, with a memorial to His Excellency, the Governor-General of Canada.”

“The proposal consists of two parts. (1) The establishment of a system of Cosmopolitan time, with plans for the ready passage from this to approximate local time. (2) The choice of a Prime Meridian which should be common to all nations.”

“The convenience of a system of time-reckoning, which should be common to all the earth, is easily seen, while at the same time it is obvious that if such a reckoning be at all generally used, there must be means of readily passing from it to local time, which is intimately bound up with the daily business of

"life. The means recommended by the author, are simple and seem well devised. The difficulty is of course, to induce the different civilized nations of the world to concur in this, or any similar scheme.

"With regard to the second point, the establishment of a Prime Meridian, common to all nations, the Author has adduced strong reasons, founded on convenience, why a Meridian passing through Behring Strait, or nearly so, should be chosen. It happens that a Meridian 180° from that of Greenwich, fulfils this condition, and if this were adopted the change in existing maps, etc., which refer to the Meridian of Greenwich, as the Prime Meridian, would not be very serious

"The choice, however, of a Prime Meridian, even to the extent of adopting one exactly 180° from a Meridian at present in use, as a prime Meridian, is one upon which the susceptibilities of individual nations might make it more difficult to obtain concurrence, than upon the mere adoption of a common system of Cosmopolitan time-reckoning in the abstract.

"While disposed to look favorably on the proposed scheme, the President and Council feel that no scheme of the kind would have much chance of success, unless there were a general readiness on the part of civilized nations seriously to entertain the question."

Thus the report of the Royal Society recognizes the advantages derivable from a system of cosmopolitan time as an abstract proposition. The Metrological Society (Washington) points out the positive urgency of reform in the United States, advocates that the use of local time be discontinued, and strongly recommends the adoption of a uniform standard throughout the country. In Canada, as in the United States the question has become one of practical economy. Even now the necessity for some more convenient system of reckoning time is experienced, and on the completion of the railway to the Pacific Coast, the necessity will become absolute. It is, therefore, not only in the interest of North America, but as a question involving practical results of value to every civilised nation, that savants

of other countries may be consulted with the view of maturing a scheme in every respect acceptable.

In pursuance of the suggestion implied in the report of the President and Council of the Royal Society, it appears advisable that an effort be made to ascertain how far the scheme would obtain general concurrence.

The establishment of cosmopolitan time involves the primary determination of an initial Meridian, as a zero for computing the revolutions of the globe on its axis; and it is only by common consent that such Prime Meridian can be determined.

Mr. Sandford Fleming advocates the selection of a Prime Meridian, common to all nations, from the fact that its establishment is really the key to any scheme of time-reckoning, of universal application. He has submitted his views free from all local bias, and has aimed at the selection of an initial meridian and time-zero which while awakening no national susceptibilities would be generally acceptable to all civilized people.

It is earnestly hoped that this attempt to deal with an acknowledged impediment, alike to international scientific operations, and to the rapidly extending relations of trade and commerce, will be considered in a liberal spirit; and that civilized nations may be found not unwilling to concur in a proposal which offers a ready means of bringing into use some scientific system of reckoning time such as the age seems to demand.

DANIEL WILSON, L. L. D., F. R. S. E.,

President, Canadian Institute.

TORONTO, April 5th., 1880.